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# Adapting to Climate Change: helping key sectors to adapt to climate change

Findings from the Benchmarker Reports for the Adaptation Reporting Power

January 2011

# INTRODUCTION

The impacts of climate change will affect the economy, infrastructure, society and the environment. The Government's general approach to climate change adaptation was set out in its [strategic statement](#)<sup>1</sup>, published in September 2010, explaining how we will prioritise work to support a strong and sustainable green economy, resilient to future climate change.

In order to achieve this, individuals, the private sector and public sector all need to adapt and this includes the providers of the infrastructure services that this country relies on, to better account for climate risks in their plans, investments and operations.

To help, the Climate Change Act 2008 provides the Secretary of State with a Power, 'The Adaptation Reporting Power', to encourage and influence key infrastructure organisations' adaptation action.

Organisations have been asked to report on:

- *an assessment of the current and predicted impacts of climate change in relation to the organisations' functions; and*
- *a statement of the organisation's proposals and policies for adapting to climate change.*

In practice this means that organisations are required to assess the risks and opportunities to their organisation from a changing climate, and prepare proposals or policies in response.

Even though there are potentially thousands of organisations that could be asked to report, the first strategy for using the Power has targeted just 91 organisations (alongside 16 others who have been invited or have volunteered to report). These organisations are largely responsible for national infrastructure in the energy, transport and water sectors which are sectors of strategic importance to the country.

## **Purpose of the Adaptation Reporting Power**

The overall aim of the Adaptation Reporting Power is to ensure that organisations that are responsible for infrastructure understand the risks climate change poses to their activities and are making the necessary plans to respond to climate change.

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<sup>1</sup> <http://www.defra.gov.uk/environment/climate/documents/adapting-new-approach-100916.pdf>

The Adaptation Reporting Power will enable Government and others (e.g. the Adaptation Sub-Committee<sup>2</sup>, regulators, investors) to gain better information on:

- *Levels of preparedness and risks of key infrastructure sectors.*
- *Actions that organisations are taking as a result.*
- *Areas where Government and others (e.g. regulators, academic/scientific community) may need to act.*

The reports will be of value to the Government, forming an important part of our efforts to increase the country's preparedness to the impacts of climate risks in key sectors and providing additional evidence to Government to help support those sectors to adapt.

## **Potential Benefits of the Adaptation Reporting Power**

The Reporting Power will help to increase our knowledge of how organisations are at risk from climate change and how they are responding and/or planning to respond to this risk. This approach will:

- *Assess the degree to which infrastructure companies are preparing for climate change.*
- *Map climate change risk across important sectors and inform wider adaptation work such as the UK Climate Change Risk Assessment and the National Adaptation Programme.*
- *Help raise the profile of adaptation to Board level within individual organisations.*

## **Aim of this Report**

The aim of this report is to present some of the initial findings from the first seven reports that we have received. This should be of benefit to the remaining Reporting Authorities who are still to submit their reports. It will also be useful for any organisation that is thinking about how they should go about embedding adaptation into their business planning and processes.

The report looks at some of the areas of strength that are emerging in the reports we have received so far, highlights areas of good practice, and details some of the areas that might require further work or research in the future. It is not intended to provide an exhaustive summary of the seven reports.

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<sup>2</sup> <http://www.defra.gov.uk/environment/climate/adaptation/ccra/index.htm>

## Who are the bench markers?

- *Environment Agency*
- *Natural England*
- *National Grid (both Electricity & Gas)*
- *Highways Agency*
- *Network Rail*
- *Trinity Lighthouse*

These 6 organisations kindly agreed to play an important role in the Reporting Process and provide their reports early (Natural England, Network Rail and the Highways Agency have provided interim reports). This has allowed Defra, lead policy Government Departments and Cranfield University to pilot the evaluation process and refine the process before the bulk of the reports are delivered between January and November 2011. These reports, which have been published on the [Defra website](#)<sup>3</sup>, also act as examples which other Reporting Authorities can use as they produce their own reports.

## The Evaluation Process

The reports are being evaluated by:

**Defra's The Adapting to Climate Change Programme team** - Are the final arbiters of the reports and the advice received. They will also examine the reports and identify any barriers to action and interdependencies between risks.

**Cranfield University** - Risk experts from the Risk Centre at Cranfield University will independently analyse the risk assessment methodology and results in each Adaptation Report.

**Lead Policy Government Department** - Policy leads in relevant departments (e.g. Department for Transport for the aviation sector) and devolved administrations, where appropriate, will evaluate the Adaptation Report from a policy perspective (i.e. lessons to inform future work) and identify information gaps and barriers to action.

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<sup>3</sup> <http://ww2.defra.gov.uk/environment/climate/sectors/reporting-authorities/>

# FINDINGS

## Areas of Strength

There are a number of areas of strength in the Reports submitted by the Benchmarkers that clearly indicate that they are assessing and acting upon their climate change risks. These include:

### **Evidence of the embedding climate change adaptation (e.g. within risk**

#### **Case Study: Trinity House – Needles Lighthouse**

*Trinity Lighthouse developed a planning process that allows for a flexible approach to adaptation and can take into account any predicted changes in climate. Given the speed of the predicted changes it allows those areas of the operation at risk, whether from sea level rise or cliff or beach erosion, to be modified or replaced as required. This ensures that early action can be taken at lower cost, than might otherwise be the case with a more reactive approach.*

*An example of this flexible approach is the work required to protect the foundations at Needles Lighthouse on the Isle of Wight. This is being reinstated with new protection to one metre above high water level. The need for the work was assessed following a routine survey; a design developed; and a project formed to deliver the revised foundations.*

**management within organisations** – A number of the Benchmarkers have embedded climate change within their organisations. This was evident in a number of reports outlining how the organisations are incorporating climate change within corporate risk management procedures (e.g. their risk register) and/or strategic objectives.

**Internal climate change capacity** – The Benchmarker Reports have illustrated that there is a good level of awareness and capacity within their organisations. This includes:

- *In house risk assessment/report production* – As far as we are aware, all of the Benchmarker risk assessments and reports were produced in house and this suggests that internal climate change expertise is being developed within the organisations.
- *Devolving responsibility for climate change* – There was evidence that some of the Benchmarkers had devolved their climate change risk assessment and adaptation planning work to the relevant areas of the organisation, promoting and enabling the building of internal expertise/responsibility throughout the organisation.
- *Internal engagement and training* – A number of reports outlined plans for internal training initiatives, including seminars and intranet dissemination of the risk assessment results.

**Research programmes** – A number of the Benchmarkers provided details of research initiatives that they are participating in to assess and adapt to their climate change risks. This included commissioning of research studies by individual organisations as well as larger long-term industry-level research programmes and even international studies.

**Advanced thinking** – A number of the reports included consideration of more advanced thinking on climate change risks and their management, including:

- *Awareness of mal-adaptation (e.g. action or investment that increases vulnerability to climate change impacts rather than reducing them, such as building new key infrastructure on a shallow coastline.*
- *The consideration of local and regional mutual defence strategies for protecting infrastructure*
- *The risk of cascade failures (e.g. climate impacts affecting one sector which also affect another sector, such as flooding of an electricity sub-station causing a water treatment plant to fail) and regional convergences of infrastructure which if impacted by an extreme weather event, could have consequences on a national scale.*
- *Assessing whether current engineering and design standards will be appropriate in the future.*

## **Examples of Good Practice**

A number of examples of good practice were identified in the Benchmarker Reports, these include:

### *Environment Agency*

- The inclusion of timescales and indicative costs and resource implications associated with reducing the Environment Agency's climate change risks was good in their report.
- The Environment Agency considers supply chain and estates procurement interdependencies and barriers, which were not considered by all Reporting Authorities.
- The Environment Agency's Report provides a good example of how an organisation with a large number of business areas that need to adapt to climate change may wish to present and format their document. In particular, the decision to split the report into more useable sections was very good because it resulted in a very readable, rather than unwieldy report.

### *Trinity House*

- Trinity House's risk matrices cover three time periods and provide an illustration of how climate change risks may change in the future. This includes some indication of timescales and the way that adaptation measures can reduce those.
- Trinity House includes good examples of embedding climate change risks into corporate risk management processes. In particular, climate change forms an element of its 2009 Risk Management Review and is included in Trinity House's register of significant business risks.
- Trinity House's plans for monitoring and reviewing their climate change risks and adaptation plans could be considered as best practice standards.
- Trinity House provides a good example of the indicative costs and benefits associated with adaptation, and the benefits of adapting early, through its example of the Needles Lighthouse on the Isle of Wight (see Case Study on page 5).
- Trinity House also consider the impact of climate change on staff comfort and the supply chain in their risk assessment, which are potentially significant issues that were not always considered by the other Benchmarkers.

### *National Grid (reports for Gas and Electricity Transmission)*

- The Reports submitted by National Grid Gas and National Grid Electricity Transmission both provide an open and transparent discussion of the risks that they have identified.
- The National Grid Electricity Transmission report provides a detailed discussion of barriers and interdependencies, which includes consideration of cascade failures, regional convergences, regulatory and market barriers amongst others.
- The National Grid Gas Report includes an interesting discussion of the internal barriers and challenges associated with adapting their infrastructure to climate change. This includes the need to maintain and develop policies and standards, embedding climate change in operational business decisions, and ensuring that those involved in planning, investment and asset management roles have an understanding of climate change projections, science and impacts.

- The National Grid Electricity Transmission report contains a detailed description of the climate change research initiatives that the organisation is involved in, including a comprehensive list of projects that have considered climate change, and industry-wide research collaborative studies, such as ETR 138 (see case study on page 9).

#### *Natural England (interim report)*

- Natural England describe how the organisation is conducting both national and sub-national level climate change risk assessments which will provide insights into the geographical distribution of the organisation's climate change risks. This is an example of good practice with an organisation explicitly considering spatial variations in their climate change risks.
- Natural England's decision to ask individual work areas to lead their own risk assessments and to manage their climate change risks illustrates that the risk assessment process has not simply adopted a 'top down' approach. This suggests that climate risks are being identified and managed locally and that climate change risk, expertise and capacity is being embedded throughout the organisation.
- Natural England identifies a number of possible benefits that could be triggered by an increased awareness of climate change risks and measures to adapt, such as whole landscape change. It also considers adaptation measures that may provide climate change mitigation benefits.

#### *Highways Agency (interim report)*

- The Highways Agency includes good examples of how they are taking steps to embed climate change throughout the organisation; for example, through its plans for internal training and awareness initiatives.
- The report also outlines how the organisation is using options assessment techniques to compare different options to manage the organisation's risks.

#### *Network Rail (interim report)*

- Network Rail includes useful examples of how work on their adaptation report has led to a change in the management of their climate change risks. In particular, it highlights how new positions and responsibilities have been introduced to manage climate change risks in engineering and illustrates how climate change is being embedded within the organisation.
- Network Rail provide a good justification for its decision not to assess its climate change risks beyond 2050s due to the divergence in UK Climate Projections and the 30 year planning horizon associated with the Rail Technical Strategy.

### **Case Study: National Grid – ETR 138**

*The serious incidents of flooding in the South Midlands and South Yorkshire during the summer of 2007 and an incident at Carlisle in 2005 highlighted the potential vulnerability of electricity substations to major flood incidents from current levels of flooding.*

*In the absence of any specific guidance on the level of acceptable flood risk or regulatory impact assessment, an industry Engineering Technical Report, ETR 138, was developed. It set out a common approach to the assessment of flood risk (inclusive of allowances for climate change and sea level rise) and the development of target mitigation levels that are subject to cost benefit assessment.*

*The Task Group that produced ETR 138 comprised representatives from Networks Companies, DECC, OFGEM, EA, SEPA, Met Office and the Pitt Review Team. The report was accepted by the Energy Emergencies Executive Committee and companies have begun a circa ten year programme of work to improve substation resilience to flooding.*

## **Potential areas for further work**

Although it is very early in the process and we are only looking at a small number of reports there are themes that emerge from the evaluation of these 7 reports where further work or research may be required either on a sector basis, by organisations themselves or on a larger scale by Government. These include:

### **Focus on risk analysis rather than management –**

The findings from the reports suggest that Reporting Authorities are currently focussing on risk analysis as opposed to risk management and adaptation planning. Further research may be required to determine whether this is due to the interim nature of a number of the reports, or whether organisations in general are only just starting to assess their climate change risks.

**Regulator influence on adaptation** – A number of the reports discussed the challenges posed by regulatory cycles. This needs further examination, in particular following the receipt of all the relevant economic regulators' reports.

**Barriers** – Evidence from the reports suggests that organisations are struggling to identify and overcome some specific barriers to adaptation.

**Interdependencies** – From the evidence in the reports it is clear that this is an area that requires further work; in particular, how to map and tackle interdependencies and work with other organisations/sectors to address

them. For large organisations there may also be an issue of interdependencies and possibly 'Barriers', within the organisation as well as externally.

**Natural barriers to adaptation** – some reports (i.e. Natural England) highlight natural or environmental barriers to adaptation which may have wide ranging implications, e.g. lack of "adaptation space" to enable managed realignment of the coast.

**Climate change risk assessment training and support** – The review of the first 7 reports has identified a number of emerging issues, many of which relate to areas of the risk assessments that form key elements of the Statutory Guidance and Evaluation Framework, but require further work (e.g. risk matrices not including an estimation of confidence or temporal change).

Whilst some of these issues may relate to the interim nature of a number of the reports, they may highlight a general lack of understanding of climate risk assessment methodologies and illustrate the need for the provision of training and support in this area in future. This may require further research involving Reporting Authorities to determine whether this is an issue that requires addressing in future.

**Flexible adaptation leading to inaction?** – Some of the reports identify specific areas where flexible adaptation options are required. Whilst this is a sensible approach, it can lead to less well defined planning and in many cases the reports provide little detail of how this flexibility will be monitored and how decisions made. It may be that the development of flexible adaptation plans is difficult at the organisational level, but it is not clear whether a commitment to flexible adaptation potentially leads to inaction. One approach may be for Reporting Authorities to identify review triggers (either in terms of time or forecast environmental parameters) when a decision will be made to either retain the flexible approach or commit to a particular plan of action.

## THE REPORTING POWER: NEXT STEPS

Between January and November 2011 Government will be receiving Adaptation Reports from the remainder of the Reporting Authorities from the following sectors:

- *Water utilities*
- *Electricity generators*
- *Electricity transmission*
- *Rail*
- *Strategic airports*
- *Harbour authorities*
- *Electricity distribution*
- *Gas transporters*
- *Economic regulators*

These will be published on the [Defra website](#)<sup>4</sup> once they have been signed off and approved by Ministers.

During the year there will be a series of workshops to discuss the reports for each sector. The outcomes of these workshops will be incorporated into sector summaries, which will look at the trends that exist within each sector and highlight any areas where further research might be needed or where best practice could be shared. The workshops will also offer an opportunity to take a closer look at interdependencies and for organisations to forge closer links.

In January 2012, Defra will publish a final report setting out overall findings and benefits from the 1<sup>st</sup> round of the Adaptation Reporting Power and a summary of each sector. This will be published at the same time as the Climate Change Risk Assessment is laid before Parliament.

<b>January – November 2011</b>	<b>Remaining Adaptation Reports submitted by Reporting Authorities</b>
<b>May 2011</b>	<b>Water Sector Workshop</b>
<b>July 2011</b>	<b>Transport (maritime) Sector Workshop</b>
<b>August 2011</b>	<b>Transport (road and rail) Sector Workshop</b>
<b>September 2011</b>	<b>Environmental Public Bodies Sector Workshop</b>
<b>October 2011</b>	<b>4 Energy Sector Workshops Transport (aviation) Sector Workshop</b>
<b>November 2011</b>	<b>Regulators Sector Workshop</b>
<b>January 2012</b>	<b>Final Report on the first round of the Adaptation Reporting Power published</b>

Table 1 - timeline for the first round of the Adaptation Reporting Power

<sup>4</sup> <http://ww2.defra.gov.uk/environment/climate/sectors/reporting-authorities/>

## HOW THE REPORTING POWER LINKS TO OTHER ADAPTATION WORK IN GOVERNMENT?

Climate change Adaptation work in Government is co-ordinated through the Adapting to Climate Change Programme based in Defra. This cross departmental programme works with all sectors to enable society to adapt successfully to the changes in climate which we are facing.

**The UK's first Climate Change Risk Assessment** - [The Climate Change Risk Assessment](#)<sup>5</sup> will, by January 2012, draw together evidence - including that provided by the Reporting Authorities - and analysis which will enable all UK Administrations to:

- *understand the level of risk (including opportunities as well as threats) posed by climate change for the UK*
- *compare the risks posed by a changing climate with other pressures on the government*
- *prioritise adaptation policy options*

This is the first assessment in a series that will be updated in 5 year cycles and will draw heavily on existing evidence. In many sectors there are gaps and these will need to be filled for future cycles.

The Climate Change Risk Assessment will be laid before Parliament at the same time as the final report on the Adaptation Reporting Power.

**Adaptation Economic Assessment** - An additional [Adaptation Economic Assessment](#)<sup>6</sup> will estimate a "price-tag" of adaptation overall and outline options we have to adapt to particularly pressing risks, to base investments on a sound consideration of the costs and benefits of action.

**National Adaptation Programme** - The Government's first National Adaptation Programme will be put before Parliament in 2012. The reports from reporting authorities as well as the first Climate Change Risk Assessment and wider work under the Adapting to Climate Change Programme will be used to influence the programme's development and priorities.

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<sup>5</sup> <http://www.defra.gov.uk/environment/climate/adaptation/ccra/index.htm>

<sup>6</sup> <http://www.defra.gov.uk/environment/climate/adaptation/ccra/index.htm>

**Infrastructure & Adaptation** - The cross-departmental Infrastructure & Adaptation project is a priority project under the cross-Government Adapting to Climate Change Programme. It has the aim of:

*Identifying and examining strategic solutions to 'improve the resilience of new and existing infrastructure in the energy, ICT, transport and water sectors to future climate change impacts'.*

The project will report in Spring 2011 with a document that will set out the Government's long term objectives on adapting national infrastructure.

**[The Adaptation Sub-Committee](#)**<sup>7</sup> (ASC) - The ASC is a sub-committee of the independent Committee on Climate Change and although the ASC has no formal role in the Adaptation Reporting Power process, it will have access to the summary reports. Also in its role of scrutinising the Government performance on adapting to climate change, the ASC may wish to look more closely at each sector or individual reports.

We will be formally asking the ASC to advise the Government on how future rounds of the Adaptation Reporting Power should be utilised.

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<sup>7</sup> <http://www.defra.gov.uk/environment/climate/adaptation/ccra/index.htm>

## FURTHER INFORMATION

There are a number of different publications and websites that offer advice and support for Reporting Authorities in producing their reports.

Defra has produced [Statutory Guidance](#)<sup>8</sup> for all Reporting Authorities to help them prepare their reports.

Defra has also drawn up a list of [FAQ's](#)<sup>9</sup> which answer some of the common questions which have arisen in the course of reporting.

Cranfield University have published their [Evaluation Framework](#)<sup>10</sup> which is based on the Statutory Guidance. This will also help Reporting Authorities understand what information is required of them and how the reports will be assessed.

Advice and support is also available from the [UK Climate Impacts Programme](#)<sup>11</sup> (UKCIP) via an online resource solely for use by reporting authorities. This has materials that will help explain and explore issues relating to the Reporting Power.

## CONTACT US

If you have any thoughts or questions on this report, the Reporting Power in general, or anything else to do with adaptation please contact us by email at [acc\\_reportingpower@defra.gsi.gov.uk](mailto:acc_reportingpower@defra.gsi.gov.uk)

## ACKNOWLEDGEMENTS

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<sup>8</sup> <http://www.defra.gov.uk/environment/climate/documents/interim2/report-guidance.pdf>

<sup>9</sup> <http://www.defra.gov.uk/environment/climate/documents/interim2/report-faq.pdf>

<sup>10</sup> <http://www.defra.gov.uk/environment/climate/documents/interim2/report-framework.pdf>

<sup>11</sup> <http://www.ukcip.org.uk/>